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PRICE $5.00

GENERAL ELECTRIC CO.
Instrumentation & Control
228 W. Florence Ave.
Inglewood, Calif. 90301

INSTRUCTION MANUAL

KEPCO®

131-38 SANFORD AVE. • FLUSHING, N.Y. 11352
(212) 461-7000 • TWX #710-582-2631

MODEL SC-300-1

SERIAL NO. .....

KEPCO, INC.
131 - 38 Sanford Avenue
Flushing 55, New York

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Kepco, Inc.
Flushing, New York

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Flushing 55, New York

SEMI-CONDUCTOR
VOLTAGE REGULATED POWER SUPPLY
MODEL SC-300-1

SPECIFICATIONS:

OUTPUT VOLTAGE DC: 0-300 volts continuously variable.

OUTPUT CURRENT DC: 0-1 ampere continuous duty.

REGULATION: In the range 0-300 volts, the output voltage variation is less than 0.01% or 0.002 volt, whichever is greater, for load variation from 0 to 1 ampere, and less than 0.01% for line fluctuation from 105-125 volts.

RIPPLE VOLTAGE: Less than 1 millivolt RMS.

RECOVERY TIME: 50 microseconds.

STABILITY: The output voltage variation for a period of eight hours is less than 0.01% or 0.002 volt (whichever is greater). When this unit is turned on from a cold start, approximately 3/4 of an hour is required for the unit to reach equilibrium. The drift during the 3/4 hour period is less than 1%.

AMBIENT OPERATING TEMPERATURE: 50°C maximum. Over-temperature protection provided. Unit turns off when over-temperature occurs. Power on-off switch on front panel resets unit.

TEMPERATURE COEFFICIENT: Output voltage changes less than 0.01% per °C.

OUTPUT IMPEDANCE: Less than 0.1 ohm from DC to 1 KC. Less than 1.0 ohm from 1 KC to 100 KC.

SHORT CIRCUIT PROTECTION: When the load exceeds the maximum output current by 20%, a transistor amplifier automatically increases the impedance of the series pass transistors so that their wattage dissipation rating is never exceeded. A control which is available at the rear of the unit can be adjusted so that the over-current can be set to 120% of full load.

FUSE PROTECTION: Input fuse on front panel.

The negative reference supply and amplifier is separately fused. This fuse is located on the rear apron of the chassis and is labelled REF. fuse. This fuse has been designed into this unit to protect the reference amplifier in the event of any internal failure.

The voltage control circuit is separately fused. This fuse is located on the rear apron of the chassis and is labelled POT. fuse. This fuse has been designed into this unit to protect the 10 turn voltage control in the event of any internal failure or accidental removing of jumper bars on the rear terminations when the unit is operating.

POWER REQUIREMENTS: 105-125 volts, 50-65 cycles.

OUTPUT TERMINATIONS: DC terminals are clearly marked on the front panel. All terminals are isolated from the chassis. Either positive or negative terminal of the DC output may be grounded. A terminal is provided for connecting to the chassis. The DC terminals are also brought out to a barrier terminal board at the rear of the unit.

Two terminals on the rear terminal board are provided for remotely sensing the error signal directly at the load. This connection compensates for the voltage drop in the wires connecting the power supply to the load.

METERS: Voltmeter: 0-300 volts, 2-1/2" wide view.

Ammeter: 0-1 ampere, 2-1/2" wide view.

CONTROLS: Power on-off switch; ten turn voltage control on front panel; overload current control at the rear of the unit.

PHYSICAL SPECIFICATIONS: Height 8-3/4", width 19", depth 14-3/8", color Kepco standard gray hammertone. This unit is designed for bench use or relay rack mounting. Carrying handles are provided on the front panel.

OPERATING INSTRUCTIONS: This Semi-Conductor Voltage Regulated Power Supply is shipped without any internal packing material and may be put into operation immediately.

The remote error sensing terminals are connected directly to the rear output terminals by means of jumper bars on the barrier terminal board. The power supply is, therefore, set up for best regulation at either the front or rear output terminations.

PROCEDURE FOR OPERATING POWER SUPPLY FOR NON-REMOTE ERROR SIGNAL: Turn on the power switch. Adjust the DC voltage control to the desired output voltage. The load may either be connected to the front DC output terminals or the rear DC output terminals. If the load is connected to the rear output terminals, the voltage across the front panel output terminals is regulated for load except for the very small drop in wires connecting front to rear terminals.

PROCEDURE FOR OPERATING POWER SUPPLY FOR REMOTE ERROR SIGNAL: With the power supply turned off, remove the jumper bars from the remote error terminals located on the rear terminal board. Use twisted

Use twisted pair wire for connecting the + and - output terminals from the rear of the chassis to the load. Use another set of twisted pair wires connecting the + and - remote error signal terminals to the load contacts. Add a 150 MF, 450 volts capacitor across terminals 5 and 7. (See Fig. I.)

REMOTE ERROR CONNECTIONS

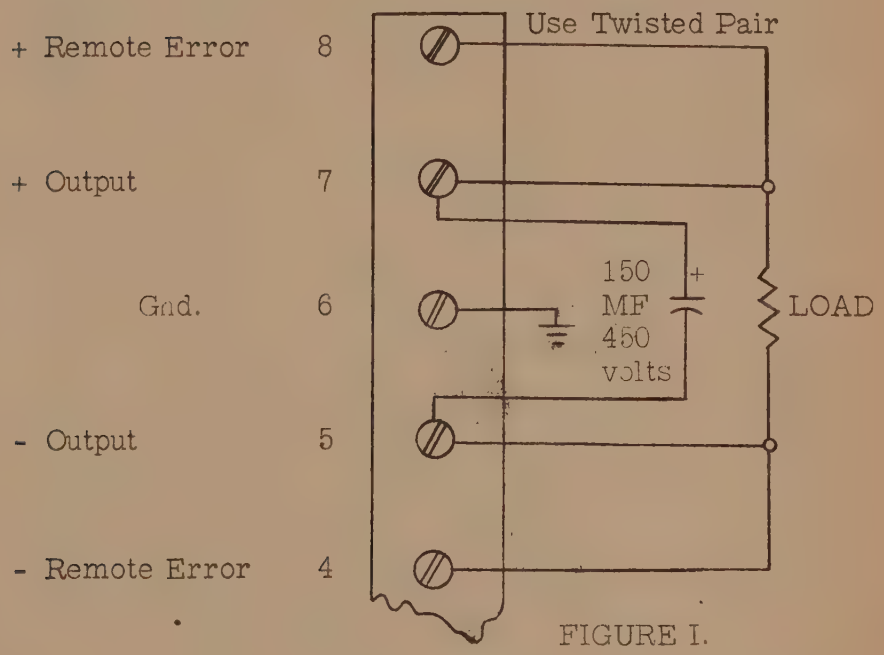


FIGURE I.

OVERLOAD PROTECTION DEVICE: The automatic current limiting device in this unit is part of the regulator amplifier circuit. When the current exceeds a pre-set value, the control amplifier increases the impedance of the pass elements so that the current never exceeds this pre-set value. This current has been set at approximately 120% of the maximum output current. Should it become necessary to readjust this overload current setting, a

potentiometer, labelled "Current Limit Adjust", is available at the rear of the unit. This control should be set to 120% of the maximum current rating of the power supply, with voltage control 1 turn from min. (c.c.w.) position.

OVER-TEMPERATURE PROTECTION: In the event of fan failure or accidental blocking of air vents, a temperature measuring device mounted on one of the series pass transistor elements will automatically turn the power supply off when the temperature is excessive. Check to see whether the air vents are blocked or the fan is rotating. The fan should be operating even though the power supply has been turned off by the over-temperature protection device. To turn the power supply on again, once an over-temperature condition has occurred, remove the external load from the power supply and wait approximately 3 to 5 minutes for the unit to cool off. After this interval turn the power switch OFF and then ON again. If the power goes off the unit has not cooled to a safe operating temperature. If the fan is operating properly and the air vents are clear, there may be internal failure and the internal difficulty should be removed in accordance with the Maintenance and Repair instructions.

If the supply is operating properly, re-apply the load and let the unit operate for 10 to 15 minutes. Continued safe operation of the power supply may then be expected. If the supply shuts down with a load not exceeding the rated value of the supply, the unit should be serviced in accordance with the Maintenance and Repair instructions.

MAINTENANCE: The components of this Semi-Conductor Regulated Power Supply have been selected and tested to provide long and trouble free oper-

ating life. Replacement of transistors may be necessary on rare occasions. The transistors in the regulated reference supply and in the reference amplifier are easily accessible by removing the rear cover plate. This cover plate is fastened with six screws. The pass transistors are of a plug-in type and are accessible by removing the top cover plate. Each plug-in pass transistor is retained by two screws. Access to these screws can be achieved by removing the bottom cover.

Maintenance should be done only by qualified personnel who know transistor regulator circuitry. Serious and costly damage can result from inexperienced probing in the unit.

REPAIRS: Should any trouble develop in the instrument, it may be serviced with the aid of the schematic diagram. Major repairs, however, are usually handled by the factory.

Under no circumstances should the instrument be returned to the factory without proper authorization and shipping instructions. In any correspondence with the factory concerning repairs, the type and serial number of the instrument must be given together with a description of the trouble encountered.

PARTS LIST OF POWER UNIT - MODEL SC-300-1

DRAWING S-SC-300-1-02

B201	- Fan		
C101	- 0.25	MF	600 WV
C201	- 500	MF	350 WV
C202	- 500	MF	350 WV
C203	- 350	MF	450 WV
C204	- 350	MF	450 WV
C205	- 500	MF	350 WV
C206	- 500	MF	350 WV
C207	- 0.1	MF	600 WV
C208 thru C215	- 0.01	MF	2000 WV
C216 thru C224	- 0.01	MF	1000 WV
C301	- 350	MF	50 WV
C302	- 100	MF	12 WV
C303	- 500	MF	12 WV
C304	- 0.5	MF	600 WV
C401	- 10	MF	150 WV
C402	- 0.22	MF	200 WV
C403	- 10	MF	150 WV
CR201 and CR202	- Silicon Rectifier 1R803B1S1		
CR203 and CR205	- Silicon Rectifier PT-5		
CR301 thru CR306	- Germanium Rectifier 1N91		
CR401 and CR402	- Silicon Rectifier PT-5		
F101	- 15 Amp. Fuse		
F201	- 1/8 Amp Fuse		
F202	- 1-1/2 Amp. Fuse		
M101	- Meter, 0-1 A DC		
M102	- Meter, 0-300 V DC		
PL101	- Neon Pilot Light NE-51		
Q301	- Transistor 2N382 (Alternate 2N383)		
Q901 thru Q920	- Transistor 2N174-8		
Q921	- Transistor 2N441-2		
R101	- 100	K	10 turn Pot.

PARTS LIST OF POWER UNIT - MODEL SC-300-1

DRAWING S-SC-300-1-02

R201 thru R218	- 40	Ohm	75 watt WW
R219	- 30	K	10 watt WW
R220	- 30	K	10 watt WW
R221 and R222	- Omitted		
R223	- 30	K	10 watt WW
R224	- 30	K	10 watt WW
R225	- 10	K	20 watt WW
R226	- 200	Ohm	20 watt WW
R227	- 500	Ohm	20 watt WW
R228	- 500	Ohm	20 watt WW
R301	- 1.5	Ohm	3 watt WW
R302	- 470	Ohm	1/2 watt
R303	- 100	Ohm	2 watt
R304 and R305	- Omitted		
R306	- 47	Ohm	1/2 watt
R401	- 82	K	1/2 watt
R901 thru R920	- 1	Ohm	3 watt WW
RL201	- 4PDT Relay		
RL202	- SPDT Relay		
S101	- SPST Switch		
S901	- Thermoswitch N.C		
T101	- Powerstat, Q116U		
T201	- Kepco #100-1099		
T202	- Kepco #100-1100		
T203	- Kepco #100-1039		
TB201	- Jones #8-142-Y		

kepco REPLACEMENT PARTS LIST

MODEL TRAM 6 Code 12-2061

SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
C1	1	Capacitor, Electrolytic, Pigtail, 25 µf, 25 v Type	Industrial Cond. 1B1063	117-0105
C2	1	Capacitor, Mylar 2 µf, 200 v	Hopkins Eng. 2P2MK	117-0129
C3	1	Capacitor, Mylar 0.4 µf, 200 v	Hopkins Eng. P42MK	117-0128
CR1, 2	2	Silicon, Rectifier, Pigtail	Autpmatic PT5	124-0028
Q1	1	Transistor, PNP	Delco	**119-0016
Q2, 3, 4, 5, 6, 8, 11	7	Transistor, PNP	Tung Sol	**119-0022
Q7, 9, 10	3	Transistor, NPN	General Trans.	**119-0024
R1	1	Resistor, Fixed, Molded 3.3 K, 1/2 w, 10%	Allen Bradley EB3321	115-0439
R2	1	Resistor, Fixed, Molded 2.2 K, 1/2 w, 10%	Allen Bradley EB2221	115-0466
R3, 4, 11	3	Resistor, Fixed, Power, Axial 500 ohm, 3 w, 5%	Ward Leonard 3X500	115-0459
R5	1	Resistor, Fixed, Molded 4.7 K, 1/2 w, 10%	Allen Bradley EB4721	115-0467
R6, 7, 10	3	Resistor, Fixed, Power, Axial 2.5 K, 3 w, 5%	Ward Leonard 3X2500	115-0469
R8	1	Resistor, Fixed, Power, Axial 10 K, 3 w, 5%	Sprague Electric 151E-10K	115-0460
R9	1	Resistor, Fixed, Molded 1.8 K, 1/2 w, 10%	Allen Bradley EB1821	115-0473
R12	1	Resistor, Fixed, Precision 1.85 K, 1/2 w, 1%	Dale Products WS-1/2	115-0472
R13	1	Resistor, Fixed, Power, Axial 100 ohm, 3 w, 5%	Ward Leonard 3X100	115-0471
R14	1	Resistor, Fixed, Power, Axial 200 ohm, 3 w, 5%	Ward Leonard 3X200	115-0803
R15	1	Resistor, Fixed, Power, Axial 1.1 K, 3 w, 5%	Ward Leonard 3X1100	115-0602
R16, 20	2	Resistor, Fixed, Molded 4.7 K, 1/2 w, 10%	Allen Bradley EB4721	115-0467
R17	1	Resistor, Fixed, Molded 430 ohm, 1/2 w, 5%	Allen Bradley EB4315	115-0581

**See Field Replacement Page

REPLACEMENT PARTS MAY BE ORDERED FROM KEPCO INC. ORDERS SHOULD INCLUDE KEPCO PART NUMBER AND DESCRIPTION.

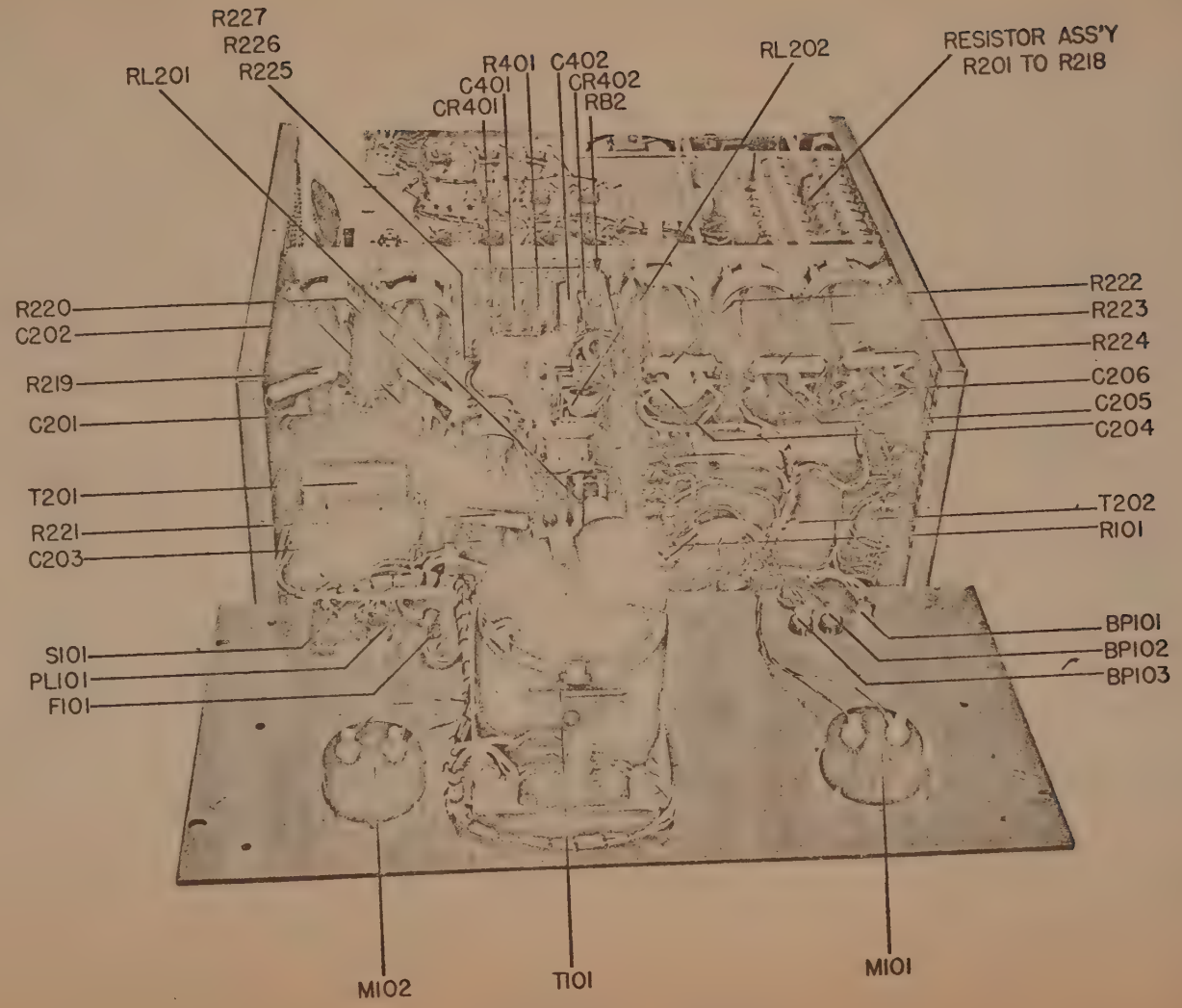
PLEASE NOTE: THE MANUFACTURER'S NAME AND PART NUMBER LISTED FOR EACH ITEM ON REPLACEMENT PARTS LISTS REPRESENTS AT LEAST ONE SOURCE FOR THAT ITEM AND IS LISTED SOLELY FOR THE CONVENIENCE OF KEPCO EQUIPMENT OWNERS IN OBTAINING REPLACEMENT PARTS. ONLY WE RESERVE THE RIGHT TO USE EQUIVALENT ITEMS FROM ALTERNATE SOURCES. KEPCO, INC.

MODEL TRAM 6 Code 12-2061

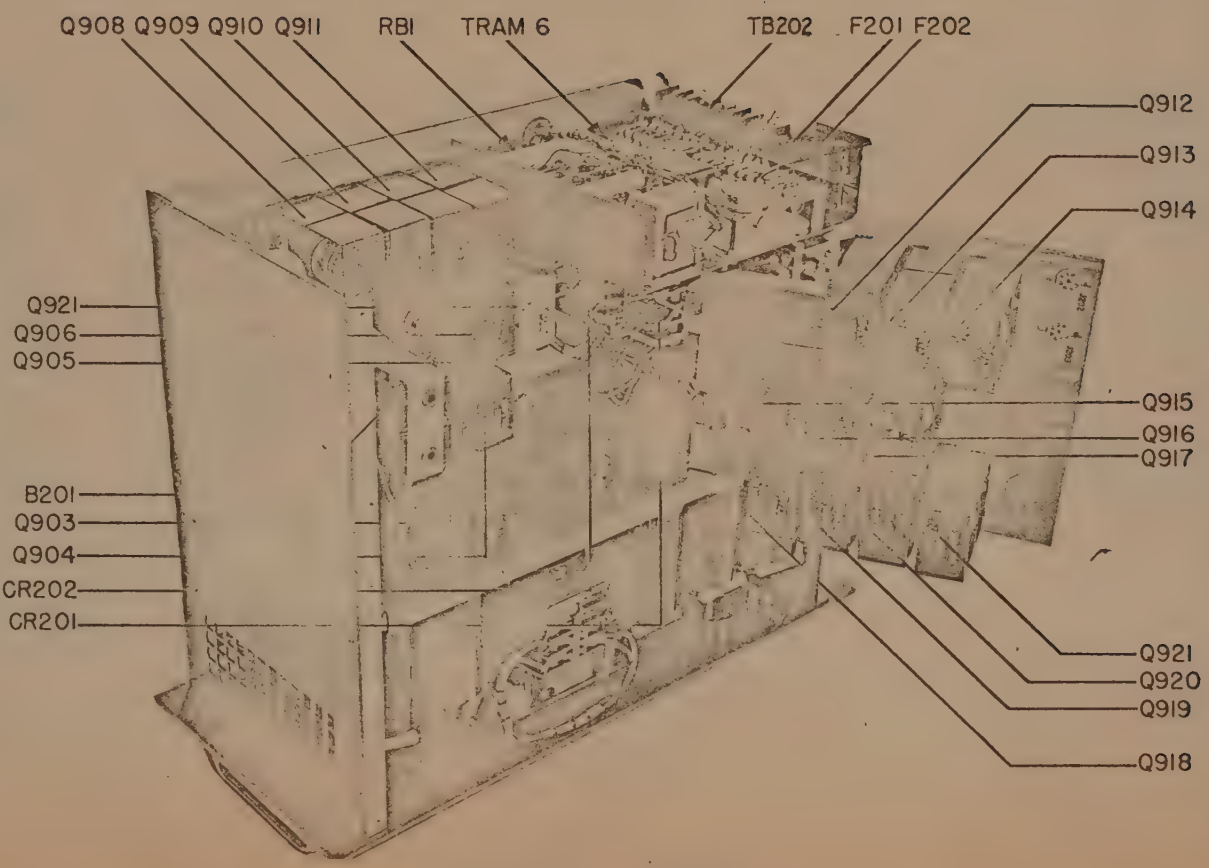
SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
R18	1	Resistor, Fixed, Molded 1.5 K, 1/2 w, 10%	Allen Bradley EB1521	115-0578
R19	1	Resistor, Fixed, Molded 470 ohm, 1/2 w, 10%	Allen Bradley EB4711	115-0608
R21, 24	2	Resistor, Fixed, Molded 10 ohm, 1/2 w, 10%	Allen Bradley EB1001	115-0502
R22	1	Resistor, Fixed, Molded 100 ohm, 1 w, 10%	Allen Bradley GB1011	115-0002
R23	1	Resistor, Variable Composition 500 ohm, 2 w, 10%	Allen Bradley JA1L040S501UZ	115-0625
RD1	1	Zener Diode	Hoffman 1N429	121-0001

REPLACEMENT PARTS MAY BE ORDERED FROM KEPCO, INC. ORDERS SHOULD INCLUDE KEPCO PART NUMBER AND DESCRIPTION.

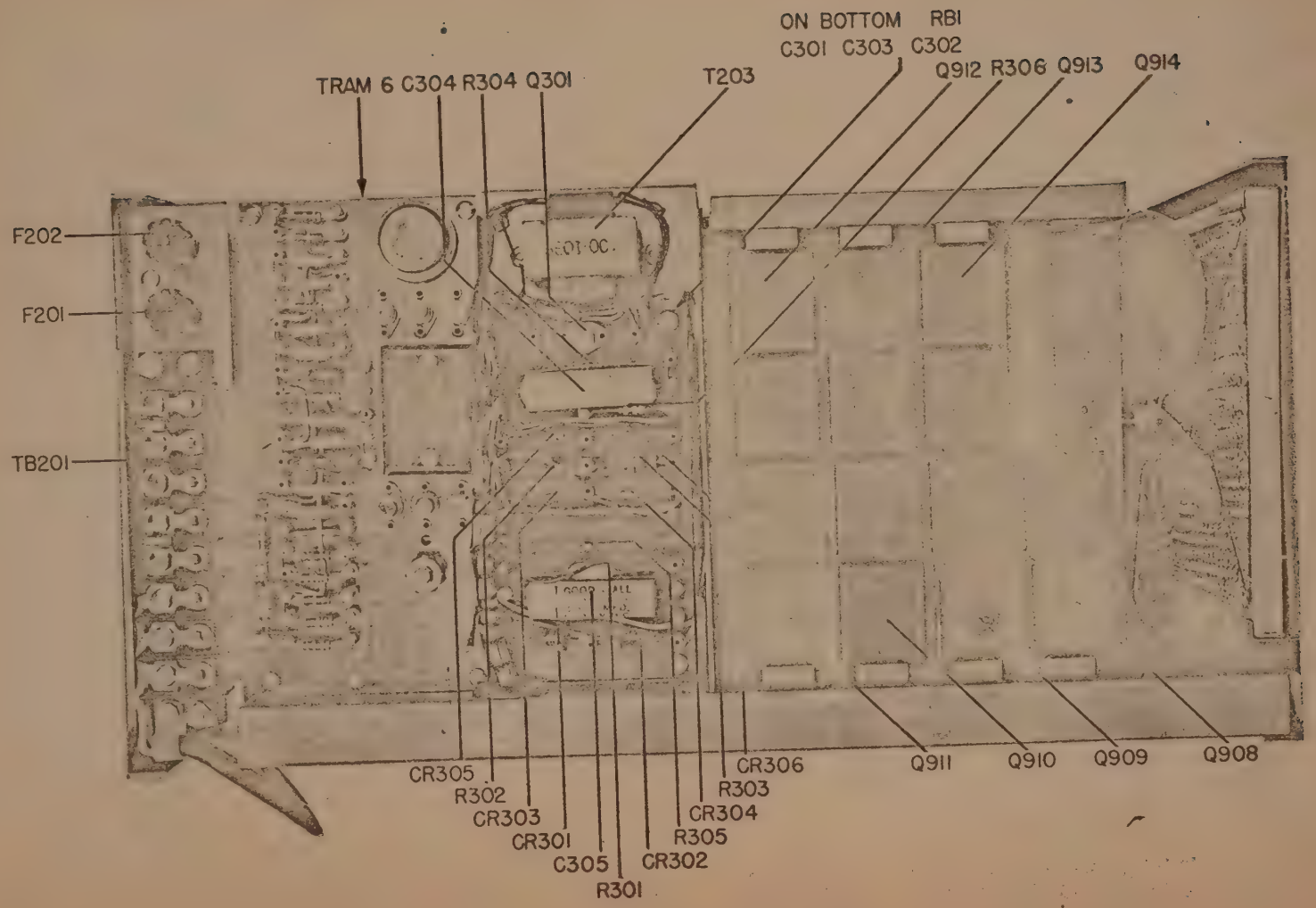
PLEASE NOTE THE MANUFACTURER'S NAME AND PART NUMBER LISTED FOR EACH ITEM ON REPLACEMENT PARTS LISTS REPRESENTS AT LEAST ONE SOURCE FOR THAT ITEM AND IS LISTED SOLELY FOR THE CONVENIENCE OF EQUIPMENT OWNERS IN OBTAINING REPLACEMENT PARTS LOCALLY. WE RESERVE THE RIGHT TO USE EQUIVALENT ITEMS FROM ALTERNATE SOURCES. KEPCO INC.



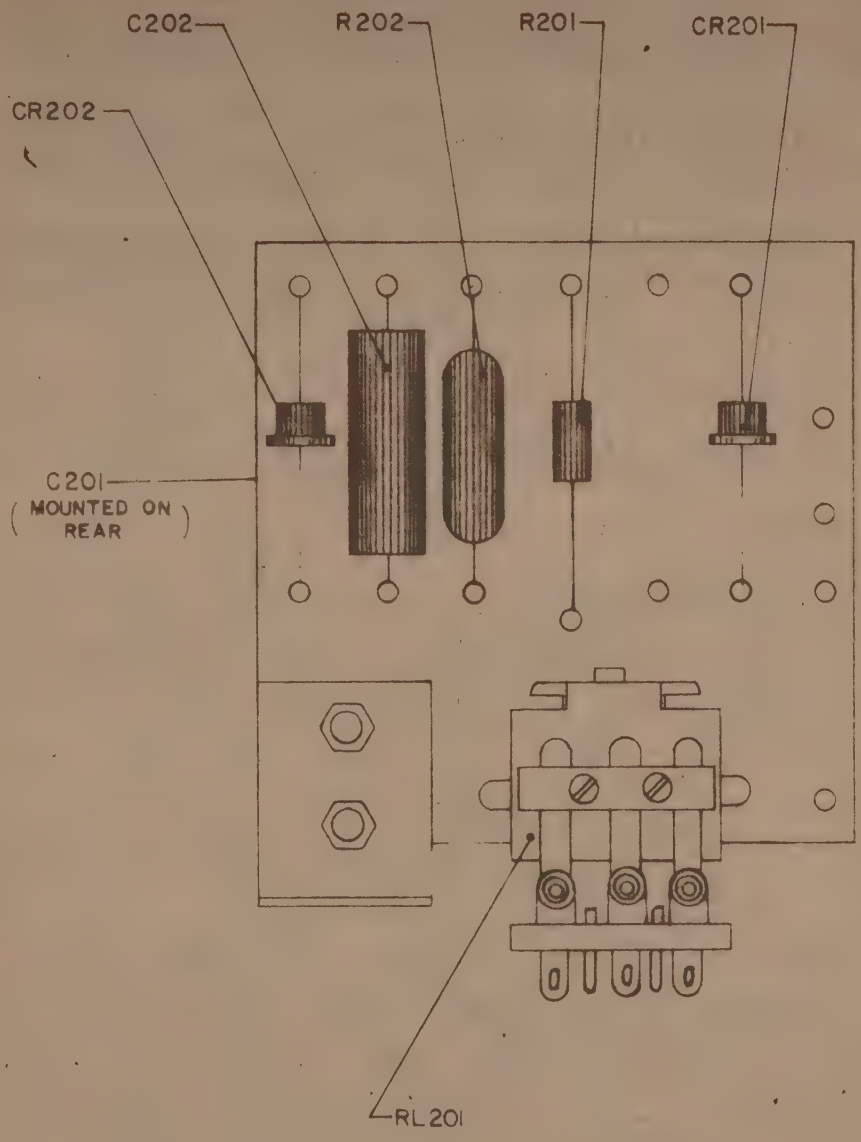
SC-300-1 FRONT



SC-300-1 INTERIOR


ON BOTTOM RBI
C301 C303 C302
TRAM 6 C304 R304 Q301
T203
Q912 R306 Q913
Q914
F202
F201
TB201
CR305
R302
CR303
CR301
C305
R301
CR302
R305
CR304
R303
CR306
Q911
Q910
Q909
Q908

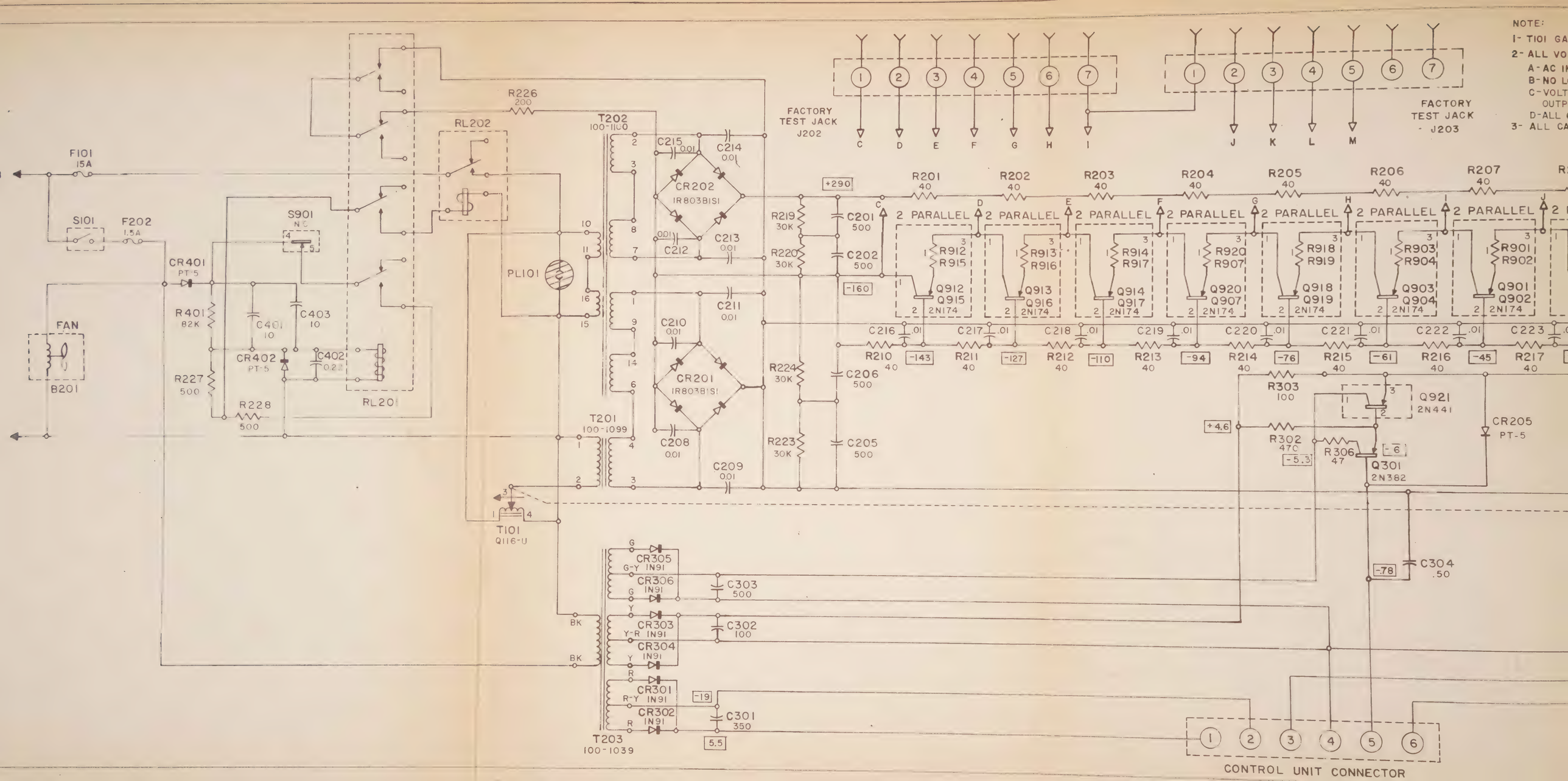
SC-300-1 REAR



KEPCO LABORATORIES

FLUSHING NEW YORK

ITEM RB-2	DES 3-6-61
	APPD
MODEL	DFTM RC
DWG. No AM0109I	CHKD


NOTE:
1- T101 GA
2- ALL VO
A-AC IN
B-NO L
C-VOLT
OUTP
D-ALL
3- ALL CA
FACTORY TEST JACK J202
FACTORY TEST JACK - J203
C D E F G H I
J K L M
F101 15A
S101
F202 1.5A
S901 NC
CR401 PT-5
R401 82K
C401 10
C403 10
CR402 PT-5
C402 0.25
R227 500
R228 500
FAN
B201
RL202
RL201
R226 200
T202 100-1100
PL101
T201 100-1099
T101 Q116-U
C215 0.01
C214 0.01
CR202 IR803BISI
C212 0.01
C213 0.01
C211 0.01
C210 0.01
CR201 IR803BISI
C208 0.01
C209 0.01
R219 30K
R220 30K
R224 30K
R223 30K
C201 500
C202 500
C206 500
C205 500
+290
-160
R201 40
R202 40
R203 40
R204 40
R205 40
R206 40
R207 40
2 PARALLEL
R912 R915 Q912 Q915
R913 R916 Q913 Q916
R914 R917 Q914 Q917
R920 R907 Q920 Q907
R918 R919 Q918 Q919
R903 R904 Q903 Q904
R901 R902 Q901 Q902
2N174
C216 .01
C217 .01
C218 .01
C219 .01
C220 .01
C221 .01
C222 .01
C223 .01
R210 40
R211 40
R212 40
R213 40
R214 40
R215 40
R216 40
R217 40
-143
-127
-110
-94
-76
-61
-45
R303 100
Q921 2N441
+4.6
R302 470
-5.3
R306 47
-6
Q301 2N382
CR205 PT-5
-78
C304 .50
CR305 G-Y IN91
CR306 IN91
CR303 Y-R IN91
CR304 Y IN91
CR301 R-Y IN91
CR302 IN91
C303 500
C302 100
C301 350
-19
5.5
T203 100-1039
BK
CONTROL UNIT CONNECTOR

D TO R101

GES TAKEN UNDER FOLLOWING CONDITIONS.

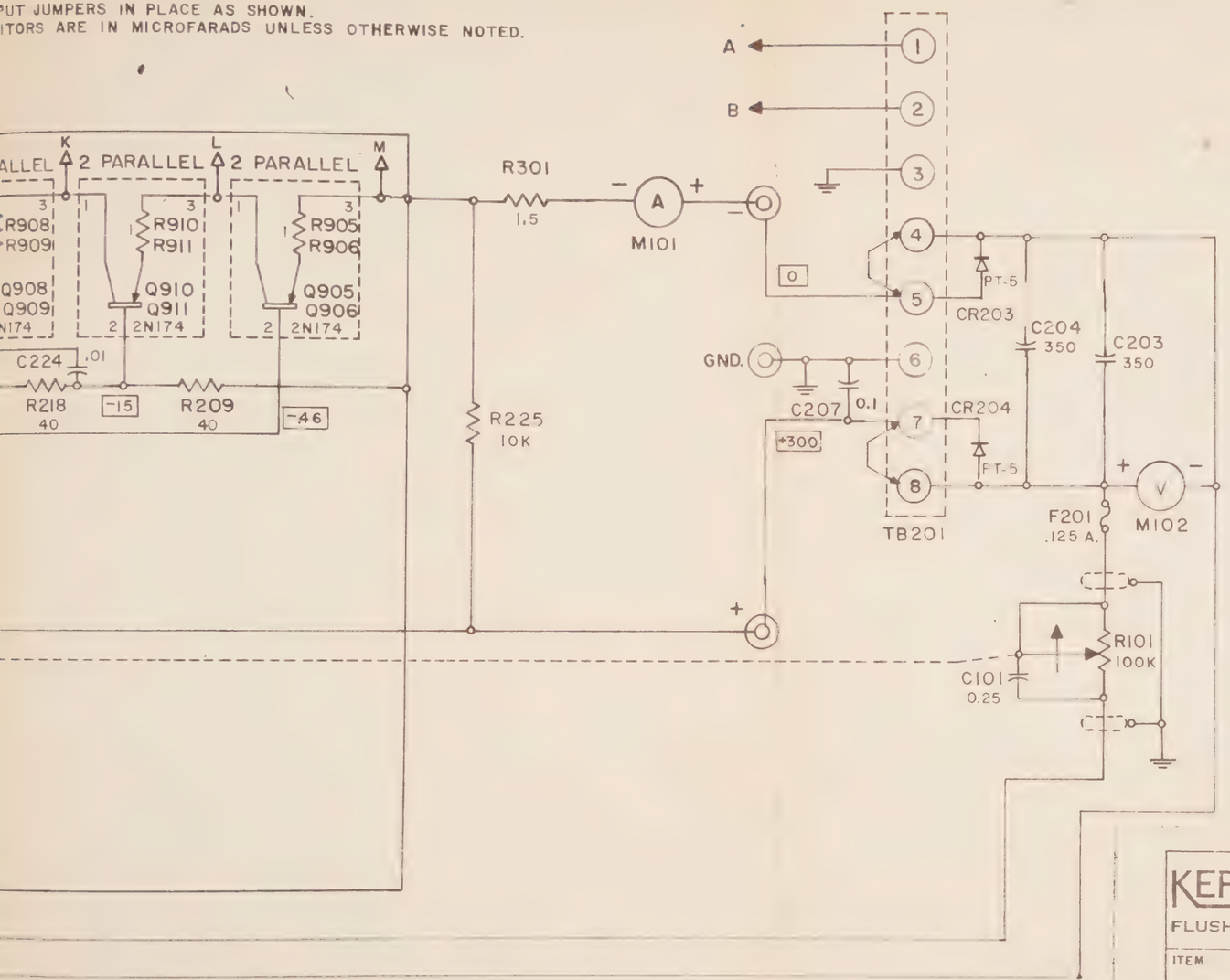
=115V

WITH OUTPUT VOLTAGE SET TO MAXIMUM RATED VALUE.

S MEASURED AT 20,000Ω/VOLTS WITH RESPECT TO NEGATIVE TERMINAL, UNLESS OTHERWISE NOTED.

PUT JUMPERS IN PLACE AS SHOWN.

ITORS ARE IN MICROFARADS UNLESS OTHERWISE NOTED.



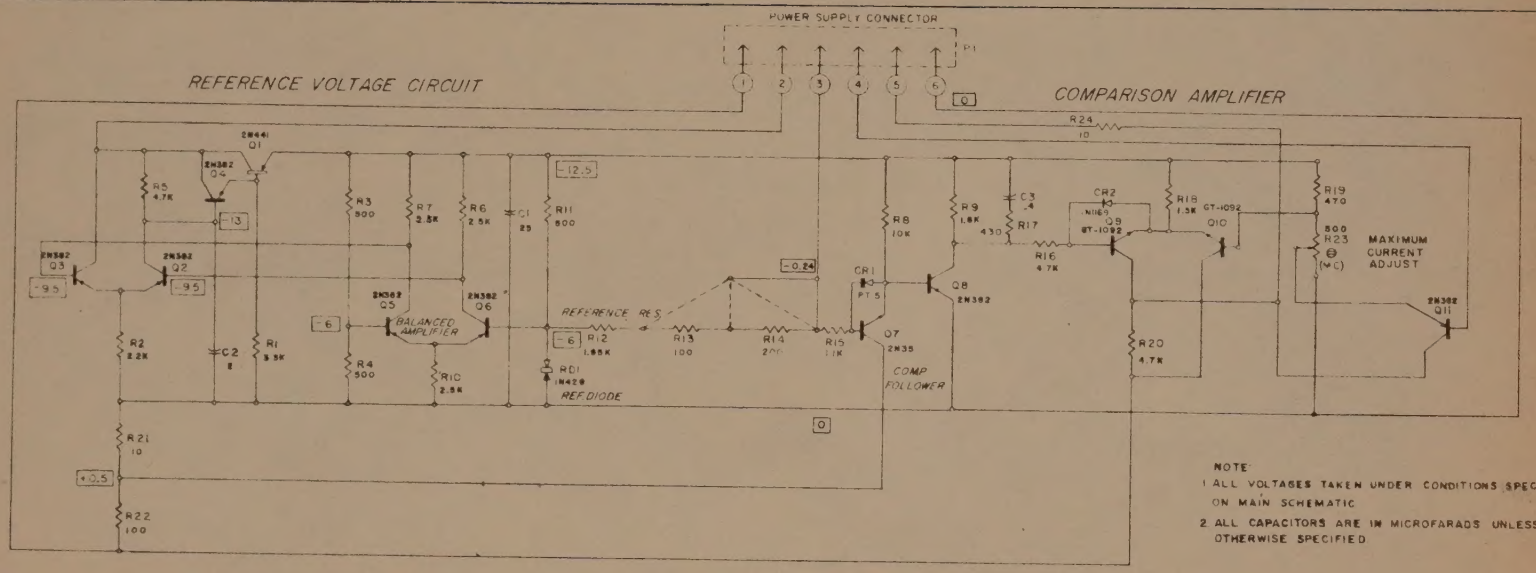
REAR TERMINAL STRIP

8	+ REMOTE ERROR SIGNAL
7	+ OUTPUT
6	GROUND
5	− OUTPUT
4	− REMOTE ERROR SIGNAL
3	GROUND
2	HOT
1	NEUTRAL

KEPCO LABORATORIES

FLUSHING NEW YORK

ITEM POWER UNIT	DES.
	APPD 5-2-60
MODEL SC-300-1	DFTM A.A.L.
DWG. No S-SC-300-1-02	CHKD



NOTE:
1. ALL VOLTAGES TAKEN UNDER CONDITIONS SPECIFIED ON MAIN SCHEMATIC
2. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED

KEPCO LABORATORIES
FLUSHING NEW YORK

ITEM: CONTROL UNIT	DR: J.R.Y. 10-11-59
MODEL: TRAM-6	CHK: W.S.R.
DWG. NO. S-TRAM-6-01	REV: 0

CORRECTION SHEET FOR INSTRUCTION MANUAL

MATERIAL AFFECTED	CORRECTION
Power Unit Schematic	Change Fuse F202 from 0.75A to 1.5A

KEPCO®

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